

THE  
JOURNAL OF BOTANY  
BRITISH AND FOREIGN.

NEW MYCETOZOA.

BY G. LISTER, F.L.S.

(PLATES 524, 525.)

**Leptoderma**, gen. n.

Sporangia sessile or shortly stalked; sporangium-wall membranous, hyaline in the upper part, in the lower part thickened with granular deposits, and sometimes including minute crystalline scales of carbonate of lime. Stalk black, enclosing refuse matter. Capillitium consisting of rigid, branched, and anastomosing black threads. Spores purplish-grey.

**L. iridescens**, sp. unica. Plasmodium drab-coloured. Sporangia scattered or in small clusters, globose or hemispherical, 0.5 to 0.8 mm. diam., sessile, rarely shortly stalked, greyish-purple or purplish-brown, glossy, iridescent, dehiscing irregularly; sporangium-wall nearly colourless in the upper part, thickened and veined below with embedded deposits of brown granules, sometimes including also scattered crystalline scales of lime from 2 to 15  $\mu$  diam. Stalk very short, stout, appearing nearly black from the dark refuse matter enclosed by its pale walls, spreading below into a membranous hypothallus which is also charged with refuse matter. Columella none. Capillitium consisting of a persistent network of slender black threads, colourless at the extremities, radiating from the floor of the sporangium; the pale bases of the threads are often tubular and expanded, enclosing granular matter. Spores purplish-grey, spinulose, 10 to 11  $\mu$  diam.

Habitat. On pine-bark, twigs, leaves, &c.

This genus appears to be allied to *Lamproderma*, from which it differs in the thickened sporangium-wall, and the occasional presence there of deposits of carbonate of lime; also in the stalk enclosing refuse matter. It is more nearly allied to *Lepidoderma*, from which it is distinguished by the sporangium-wall being membranous, not cartilaginous, and from the deposits of lime being very scanty or absent.

I first found the dusky little sporangia in March, 1892, and  
JOURNAL OF BOTANY.—VOL. 51. [JANUARY, 1913.] B

LIBRARY  
NEW YORK  
BOTANICAL  
GARDEN

AUG 7 - 1923

again in December, 1894, in fir plantations at Leighton Buzzard, Bedfordshire, where they appeared on pine bark and dead leaves. The gatherings were small, and my father and I thought they might be considered an irregular sessile form of *Lamproderma columbinum* (see Brit. Mus. Cat. ed. 1, p. 126, and ed. 2, fig. 131*h*). In November, 1911, Miss Katherine Higgins found abundant sporangia on leaves and twigs amongst the lower parts of whortleberry bushes at Woburn Sands, Beds; they were both in mature condition, and arising from dirty-looking drab plasmodium. Last September, Miss Hibbert-Ware and I obtained the same form in moist spruce woods near Mürren, Switzerland, and also in the ancient pine forest of Rothiemurchas, in the north of Scotland. I have since received it from M. Ch. Meylan, who gathered it in woods near La Vaux, in the Jura Mountains, about 4000 ft. alt., not far from Neuchatel, in October last. All the specimens show the same features, except that the minute crystalline scales of lime are present in the walls of some sporangia and absent from others.

***Diderma arboreum*** G. Lister & Petch, sp. n. Plasmodium? Sporangia scattered, discoid or saucer-shaped, 0.5 mm. diam., sessile or shortly stalked, or forming irregularly expanded flattened plasmodiocarps 1 to 3 mm. diam., white, or purplish-grey when lime-deposits are scanty, smooth or wrinkled; sporangium-wall fragile, colourless, pale purplish or brownish, usually invested with an outer crust of minute round lime granules; these, however, may be absent, or represented by scattered irregular fragments of lime. Stalk pale reddish-brown or nearly black, rugose, stout or slender, 0.1 mm. high. Columella convex and flesh-coloured, or absent. Capillitium consisting of simple or branched, colourless or purplish threads, 1.5 to 3  $\mu$  diam., often anastomosing and showing irregular expansions near the extremities. Spores 10 to 15  $\mu$  diam., pale purplish or purplish-brown, minutely spinulose.

Habitat. On moss, lichens, and bark, on the trunks of living trees.

This species is allied to *D. effusum* Morgan, from which it differs in the stouter capillitium, the larger spores, and in the sporangia being sometimes stalked. It has been obtained from three widely separated regions—Ceylon, Japan, and Scotland. It was first found in May, 1906, by Mr. T. Petch in Ceylon, at Peradeniya, 1600 ft. alt., and at Talawakelle, 4000 ft. alt.; and again at Peradeniya in August, 1906. On first sending a specimen to my father, Mr. Petch suggested that the specific name "*arboreum*" might be appropriate, from the arboreal habit of the sporangia; we, however, were then inclined to regard it as a sessile form of *Diderma rugosum*, under which name Mr. Petch refers to it in the *Annals of the Royal Botanic Gardens, Peradeniya*, iv. 345 (1910).

In Japan, Mr. Kumagusu Minakata obtained similar sporangia in the summers of 1906, 1907, and 1909, in the province of Kii, on the living trunks of *Prunus Mume* Sieb. & Zucc., *P. persica* Sieb. & Zucc., and *Celtis sinensis* Pers. These Japanese gather-

ings were puzzling, as the lime deposits were scanty and in the form of irregular granules and scales, showing little of the bead-like granules characteristic of *Diderma*; the capillitium also was either scanty or irregularly developed, with many swellings and knob-like projections.

In Scotland, thanks to the keen sight and perseverance of the Rev. W. Cran, many gatherings have been made in summer and autumn in the last three years on the living trunks of elder, sycamore, &c., both at Rhyndale and Skene, Aberdeenshire. The sporangia are usually very inconspicuous objects, scattered amongst moss-tufts four or five feet from the ground on exposed trees. Although they vary much in size, shape, and the abundance of lime deposits, these numerous gatherings satisfactorily establish the constancy of the chief characters of the species.

***Diachæa cerifera***, sp. n. Plasmodium colourless. Sporangia scattered or in small clusters of two or three, stalked, subglobose or ellipsoid, 0.7 to 1.2 mm. diam., brownish-purple, shining with iridescent reflections; sporangium-wall somewhat persistent, membranous, hyaline or with a yellowish tinge at the base. Stalk brownish-black and furrowed, yellowish-brown or nearly white, 0.2 to 0.6 mm. high, 0.15 to 0.5 mm. thick; when black it may be provided at the apex with a thick yellow collar on which the sporangium rests. Columella none, or represented by the flattened summit of the stalk. Capillitium consisting of rigid, nearly black threads, pale at the extremities, 1.5 to 3  $\mu$  diam., more or less branched and anastomosing, radiating from the apex of the stalk. Spores purplish-grey, pale or dark, minutely spinulose, 10 to 18  $\mu$  diam.

Habitat. On moss and liverworts on dead wood. Norway, Jura Mountains, Japan.

We have three gatherings of this species. It was found first by the late Prof. Axel Blytt near Christiania, Norway, in September, 1879. A small specimen was sent to my father for determination. The nearly sessile sporangia were associated with those of *Lamproderma columbinum* Rost., and in the *British Museum Catalogue* the gathering is referred to as a sessile form of that species. It is described there in the following terms: "The globose sporangia are each seated on a yellowish horny cushion of dried plasmodium; there is no stalk or columella: the capillitium rises from the broad base of the sporangium, and is more rigid than in the stalked form of *L. columbinum*; the spores measure 16 to 19  $\mu$ ." (The capillitium is illustrated in Brit. Mus. Cat. ed. 2, by fig. 131 i.)

The second gathering was made by M. Ch. Meylan on the Chasseron, in the Jura Mountains, at an altitude of over 4000 ft., in July, 1910. He kindly sent me a group of five or six sporangia. They are subglobose or ellipsoid in shape, on stout brownish-black glossy stalks. M. Meylan writes that the plasmodium was white, and the stalks when first formed were yellow, becoming brown on drying; and that they were still pale when the sporangia had turned black. The spores

are paler than in the Norwegian gathering, and measure 11 to 13  $\mu$ . In water mountings, when examined under the microscope with transmitted light, these stalks are seen to have translucent yellowish-brown walls, and to enclose refuse matter. When subjected to moderate heat and pressure, yellow oily-looking drops exude from their upper parts. Similar drops also appeared when heat and pressure were applied to the "horny bases" of Blytt's sporangia.

For the third gathering we are indebted to Mr. K. Minakata, who found it on Ando Mountain, in the province of Kii, Japan, in November, 1910. It consists of about thirty somewhat weathered and mouldy sporangia on cylindrical blackish stalks. Each stalk is surmounted by a thick yellow ring or collar, from whose margin the sporangium-wall arises. The capillitium is attached to the apex of the stalk within the collar. The spores are pale purplish, 10 to 13  $\mu$  diam. The collars, which are sometimes irregular and incomplete, consist of flakes and spicules of a wax-like substance that melts into drops on application of heat. By the advice of Prof. Cavers, I treated these drops with tincture of alkannin, a dye that stains wax, but does not affect oil; from the deep crimson colour that the drops instantly took, it seems clear that they consist of wax. I think it is also most probable that the yellow exudations in the stalks of the Swiss and Norwegian specimens also consist of wax, but the material is too scanty to experiment with.

This remarkable species appears to have no very close allies. Perhaps it most nearly resembles the form of *Diachæa subsessilis* Peck in which the dark stalk is without lime deposits. It differs from all species of *Diachæa* in the absence of a columella, and appears so far to be unique among the Mycetozoa in containing deposits of wax in the stalk.

---

#### EXPLANATION OF PLATES.

Tab. 524.—Fig. 1. *Leptoderma iridescens*, a group of sporangia. 1a. Sporangium with a short stalk; the upper part of the wall has fallen away, exposing the network of capillitium; the spores are dispersed. 1b. Spore, highly magnified. 1c. Capillitium threads from the upper and lower parts of the sporangium, and spores; also a fragment of the sporangium-wall from near the base showing deposits of granules and embedded scales of carbonate of lime. 2. *Diderma arborcum*. Two sporangia, one discoid, the other forming a winding plasmodiocarp; the walls of the latter are broken, exposing the columella. 2a. Capillitium threads attached above and below to the sporangium-walls, and three spores. 2b. Spore highly magnified.

Tab. 525.—*Diachæa cerifera*. 1. Sporangia, from Japan, showing the collar at the base of the sporangium. 1a. To the right, spicules and flakes of wax from the collar; to the left, the same flakes running into globules after application of heat and pressure. 1b. Spores from Japanese sporangia. 2. Two sporangia with confluent stalks from Norwegian gathering; in the left sporangium the capillitium and spores are to a great extent dispersed, and the broad summit of the stalk is exposed. 2a. Spores from these sporangia. 3. Three sporangia from the Jura Mountains. 3a. Capillitium threads from the same, showing attachment below to the apex of the stalk. 3b. Spores from the same.

---